

XXXVII.—*The Collections of William John Burchell, D. C. L., in the Hope Department, Oxford University Museum.*

IV. *On the Lepidoptera Rhopalocera collected by W. J. Burchell in Brazil, 1825–1830.* By CORA B. SANDERS, of Lady Margaret Hall, Oxford.

[Plate VI.]

IN the course of the identification and arrangement of the large collection of butterflies in the Hope Department the Burchell specimens fell into their places in the various groups. Every fragment has been retained, even when the series of individuals was a very long one, because of the historic interest which attaches to the carefully preserved data. The identification and arrangement are the careful work of Mr. W. Holland, and in cases of special difficulty I have taken the specimens to London for comparison with those in the Godman-Salvin Collection and the British Museum. In making out many of the most puzzling species of that difficult subfamily the Ithomiinæ the late Mr. Osbert Salvin, F.R.S., very kindly gave me the invaluable help of his intimate knowledge and long experience. Dr. F. D. Godman, F.R.S., has similarly come to my aid with the most difficult of the Satyrinæ, and has also promised to name the whole of the Burchell specimens in the group upon which he is so distinguished an authority—the Hesperiidæ. Kind help has also been afforded by Mr. F. A. Heron, of the British Museum. When the arrangement of the Rhopalocera was sufficiently advanced I suggested to Miss Sanders that it would be of much interest to prepare an account of the Burchell specimens, incorporating all the data and observations recorded on the specimens and in the note-books. As I have explained above, Miss Sanders is not responsible for the identification of the species, although she has taken specimens to London to compare them afresh when it appeared possible that there might be some slight difference between them and the individuals captured in more recent years. For such possible differences Miss Sanders has kept the keenest outlook, aided in the search by Mr. Holland and myself; and it will be seen that the quest has not been altogether fruitless. The explanation of any recognizable differences, as due to a genuine change of form in three quarters of a century or to alteration in the distribution of forms, will be considered in each case as it arises. It may be said, however, that the evidence of some change is

greater than we ventured to hope for at the outset of the enquiry.

I have claimed that the Burchell Collection, with its numberless accurate data, is of the highest historic importance in enabling us to carry back "the detailed record of the occurrence of many thousands of species in two most interesting parts of the world, and to construct a trustworthy standard by which to measure the rate of future change" (Ann. & Mag. Nat. Hist., Jan. 1904, p. 46). The trustworthiness of the standard depends upon the persistence of the data unaltered from Burchell's time to this. There is, fortunately, the means of checking these data by comparison with a list of the Brazilian Arthropoda made under Professor Westwood's direction during the years which immediately followed the gift of the collection in 1866. A second list of the dates of every individual of a species in Professor Westwood's handwriting is found on one specimen of many species, and this has often been a valuable check upon the complete list when errors were suspected.

The first section of the butterflies is written in Professor Westwood's own handwriting, and deals with the Heliconiidae in the old broad sense, comprising the Ithomiinae, the genera *Lycorea* and *Ituna* of the Danainae, and the Heliconiinae. Although in the form of rough notes and very difficult to disentangle, it is a model of accuracy. It records the whole of Burchell's notes written on the labels accompanying the specimens, but apparently none of the facts to be found in his manuscript note-books. Beyond the Heliconiidae the list of butterflies is continued in an extremely clear handwriting, with great neatness of arrangement, but containing occasional slips and mistakes which can be detected by careful comparison with the existing data. It is evident that Professor Westwood arranged the vast mass of material into groups and sub-groups, and in each of these separated the forms into what he believed were distinct species. An assistant employed under his direction then copied the notes written by Burchell on the labels attached to each specimen. In some cases Westwood himself added names to the forms thus grouped together in the list; but in the vast majority of cases the list remains as it was written by his assistant. My inference from the handwriting has been kindly confirmed by my friend Miss Swann, who tells me that her uncle, Professor Westwood, employed an assistant to write for him about the time at which these lists were copied. The backs of old University Notices were employed for this purpose, and a rather valuable record of the acts of the University during some of the years

before the appearance of the 'Gazette' is to be found on the reverse sides of the sheets!

A few Notices of the years 1864, 1865, and 1867 are thus employed, together with large numbers issued in 1866 and 1869. A single paper with the date 1871 is made use of. It is therefore almost certain that the list was begun at once and finished within about six years of the gift. My first experience of the Department was in the summer of 1873, and I feel sure that the work was not going on then and was not resumed at a later date. Professor Westwood was keenly interested in the collection and appreciated it at its true worth. About six months after its arrival in Oxford he had already made a preliminary survey, and, on Nov. 26th, 1866, gave an account of it to the Ashmolean Society. The 'Proceedings' of this Society are very rare, and I have thought it well to reprint the passages in which the collection is described and its great significance demonstrated.

"On the Data afforded by the Burchellian Collection as to the Geographical and Modificational Ranges of certain Brazilian Insects. By J. O. WESTWOOD, M.A., F.L.S., Hope Professor of Zoology.

[*'Proceedings of the Ashmolean Society,'* New Series, No. I.
Read Monday, Nov. 26th, 1866.]

"Professor Westwood gave an account of the very extensive collections in various branches of zoology formed in South Africa and Brazil by the late Dr. W. J. Burchell, and presented to the University of Oxford by his surviving sister, in recognition of the honour conferred on her brother by the degree of D.C.L. some years previously. The collection was extremely rich, both in the number of species and also of individuals, and was especially valuable from the great care which had been taken in attaching the date of capture to every specimen, whereby, in conjunction with the journal kept by Dr. Burchell, the amount of geographical range and modification of each species could be accurately determined. The Brazilian portion of the collection had been made during a visit extending over three years [in reality nearly five years], in which period Dr. Burchell investigated the natural history of Rio Janeiro and its neighbourhood, thence proceeding southwards to Santos and San Paulo, thence north-westwards to Goyaz, and thence due north by the Tocantins to Para and its neighbourhood. Copious note-books were kept, and entries made daily, so that it may safely be affirmed that in respect to its geographical data no collection equal to this has ever reached Europe. The donation of the collection

to the University was also very opportune at the present moment, when the question of the existence of species, and the extent of variation to which they are subject, are especially attracting the attention of zoologists."

After giving an account of the views of various writers on these questions and expressing his own belief "in the independent and original creation of species," Professor Westwood concluded as follows:—

"A careful study of the Burchellian collection required to be made, and it could not be doubted that it would afford satisfactory data for ascertaining the specific status of many of the insects which had fallen under Dr. Burchell's notice."

It is a keen pleasure to me to realize that in gradually publishing an account of the Burchell Collection I am carrying on a work to which my great predecessor devoted so much time and thought.

A search through Burchell's manuscript brought to light a scrap of paper covered with figures which tell us much of the man and his work. It is a memorandum of the dates at which he unpacked each section of his immense collection of insects and relaxed and set out the specimens. The majority of the dates refer to the "Lepidoptera &c.," and these are reproduced below:—

"Lepidoptera &c. relaxed and put out.

[Specimens captured between following dates.]			Relaxed and set out [between following dates].
7. 9. 28 to	28. 2. 29	[Set]	26. 12. 39 to 8. 1. 40
28. 2. 29 "	29. 4. 29	"	9. 1. 40 " 3. 2. 40
30. 4. 29 "	5. 2. 30	"	4. 2. 40 " 9. 4. 40

Lepidoptera &c. relaxed and put out from the Cedarwood Box
containing [captures] from 20. 7. 27 to 16. 4. 28.

25. 8. 27 to A.[M.]	29. 8. 27	[Set]	12. 2. 44	_____
6. 8. 27 "	26. 8. 27	"	6. 4. 46	to 30. 4. 46
11. 2. 26 "	14. 2. 26	"	30. 4. 46	" 20. 6. 46
27. 1. 26 "	9. 2. 26	"	29. 6. 46	" 22. 7. 46

Lepidoptera of Rio de Janeiro, Minas, &c., &c.

27. 1. 26 to	8. 2. 26	[Set]	24. 7. 46	to 28. 7. 46
_____ "	27. 1. 26	"	28. 7. 46	" 31. 7. 46
14. 1. 26 "	_____ "	"	[31. 7. 46]	" 1. 8. 46
31. 12. 25 "	14. 1. 26	"	1. 8. 46	" 5. 8. 46
6. 12. 25 "	31. 12. 25	"	6. 8. 46	" 10. 8. 46
7. 11. 25 "	6. 12. 25	"	11. 8. 46	" 14. 8. 46
4. 11. 25 "	6. 11. 25	"	15. 8. 46	" 19. 8. 46
7. 11. 25 "	6. 12. 25	"	20. 8. 46	" 21. 8. 46
29. 10. 25 "	4. 11. 25	"	21. 8. 46	" 22. 8. 46
999] 27. 10. 25 "	29. 10. 25	"	22. 8. 46	" 8. 9. 46
819] 23. 10. 25 "	998] 27. 10. 25	"	8. 9. 46	" 23. 9. 46

N.B.—Finished putting out and unpacking the whole of my Brazilian
Insects on 26. 9. 46."

This mechanical labour was therefore completed when Burchell was about 63 years of age, 16½ years after the Brazilian journey came to an end in February 1830.

It is hardly necessary to add that the specimens were set in our old insular style, sloping and low upon the pin. Nearly all the butterflies have now been reset in accordance with modern requirements.

Burchell's method of keeping his notes on the Arthropoda was changed as time went on. At first he sorted out the captures of each day into what he believed to be species, and gave a list of these, and, in another column, the number of individuals belonging to each. Opposite these numbers observations of habits were sometimes recorded. During his journey to Rio, between April 2 and July 6, 1825, he had captured 97 kinds, distinguished by the numbers 1-97 (in Portugal, at Madeira, at Teneriffe, and on the ship). Between July 26 and Oct. 27, 1825, he had similarly distinguished species 98-1022 (during the earlier months of his residence at Rio and the greater part of his excursion into Minas Geraes). The labour was probably excessive and in the majority of cases served no specially valuable purpose; for the same work could be done better after his return home. Accordingly we find that he employed this method for the last time on Oct. 27, 1825, explaining a new meaning for all the numbers beyond 1022 in these words:—"N.B. The following Numbers are of such Insects *only* as require special and particular remark: of all the others their *locality* and *season* can be known only by referring to that same date in the Journal, or in the Catalogus Geographicus of the Botanical Collection: or to the following list of dates." The Journal is unfortunately lost, but the other two books are in the Hope Department, the second ("the following list of dates") being what I have called the "Brazilian note-book." In this latter the numbers 1023 to 1345 (Jan. 1, 1826, to March 18, 1829) occur among other entries which are distinguished by dates alone, and not by numbers. All the numbers beyond 1022 and some of the dates refer to observations made upon the living forms. The numbers of individuals are not given, but can sometimes be inferred from the descriptions. The last number 1345 refers to an observation made at Porto Real (Nacional) on March 18th, 1829; so that all the observations made during the descent of the Tocantins and at Pará, in fact from March 19, 1829, to Feb. 10, 1830, are lost, having been contained in the missing volume alluded to on p. 98 (Ann. & Mag. Nat. Hist., Feb. 1904).

It is much to be hoped that an opportunity may be found for publishing the two Oxford note-books, both on account of

their high intrinsic interest and because of the irreparable injury which their loss or destruction would inflict upon this historic collection. In order to render this and the following papers of greater permanent value, and to bring them into relation with such a publication whenever it may be issued, I propose to reproduce any of Burchell's reference numbers which are still to be found attached to the specimens. The vast majority of these are, however, distinguished by their dates, and have no such numbers. The following example will serve clearly to distinguish between Burchell's reference numbers and those which are now added to bring the specimens into relation with these papers:—

Bz. 907. *III.* + 25. 10. 25. 2 ♀ = **37, 38.**

Burchell's reference number will be printed *before* the date of capture and in italics, while the numbers now added will always appear *after* the date and printed in heavy type. *Bz.* indicates that the date or number immediately following is an original label, written in Brazil. *III.* refers to the number of individuals recorded in Burchell's note-book as far as the number 1022. In this case two are accounted for by specimens **37** and **38**, while the third is to be found upon **40** under an allied species. The + indicates that the specimens also bear labels which were carefully written and added after Burchell's return to England. Examples are seen in the labels to the right of figs. 9 and 10 on Pl. VI., where the Brazilian number is lowest. When *Bz.* is wanting, Burchell had copied the reference number and removed the original, as in the label accompanying fig. 11. *Bz.* without the + is used when the specimen bears only a Brazilian label (as in fig. 6). In all such cases as this the dates have been recovered from the Brazilian note-book. All the other figures on Plate VI. are without Brazilian labels, and bear dates, sometimes accompanied by notes (figs. 5 and 8), carefully written after the return home; and this is true of the great majority of the specimens hereafter recorded, all, indeed, of which the dates are not preceded by italicized letters or numbers. In many cases the original Brazilian date was never copied and remains as the only label. Such dates are preceded by *Bz.*

I trust that these directions will enable the reader to ascertain at a glance exactly what records of the great naturalist accompany or refer to each specimen in the collection to which he devoted so large a part of his life.

E. B. POULTON.

Oxford, Jan. 25, 1904.

I. ITHOMIINÆ.

Heterosais edessa, Hew.

16. 9. 26. 2 ♂ = 1, 2. Santos. "Close above the Monastery of São Bento." "Ad marginem Sylvæ."
 23. 9. 26. 4 ♂ = 3-6, 1 ♀ = 7. Santos. 3 and 7 bear Brazilian labels.
 26. 11. 26. ♂ = 8. Santos. "In the chácara (where I resided) near the Monastery of São Bento."

It has already been stated that the list of Ithomiinæ is in Professor Westwood's handwriting.

The determination and sexing of specimens 1-8 agree with Westwood's. His notes show that there were two more specimens which cannot now be found. Both were males and dated 12. 1. 26 (Rio) and 23. 9. 26 (Santos).

Hymenitis adasa, Hew.

- Bz. 693. I. 22. 10. 25. ♀ = 9. Minas Geraes. "In a Roça (about 4 miles S.S.W. of the house of Discoberto), on the road towards San João de Nepomucena." "*Papilio*."
 8. 2. 26. 3 ♀ = 10-12. Organ Mountains. Near head of R. Pacaqué. "In a ride to the Cattle Pounds and the Milho Roça."

Agrees with Westwood's notes except as regards 12. Concerning this specimen he had written "Very like *adasa*, but with diff. veins," and "Not in Hewitson Coll. or book." On 11 he had written in pencil "♀ agrees with *adasa* ♀ Hew. in its veins of h. w. but not with ♂."

Hymenitis erruca, Hew.

23. 9. 26. 2 ♂ = 13, 14. Santos.

Determined by Westwood as *polissena* ♂. On 13 he wrote "seems identical with *Polissena* from Quito."

Pseudoscada sp. near *utilla*, Hew.

8. 2. 26. ♂ = 15. Organ Mountains. (As 10-12.)

Compared with Hewitson's specimens of *utilla* in the British Museum 15 appears to be a less heavily marked form of the same species.

Determined by Westwood as ♂ *acilla*.

Pseudoscada Jessica, Hew.

11. 2. 26. 2 ♂ = 16, 17. Organ Mountains. "By the River Pacaqué." "In a walk to the Ipé trees."

14. 2. 26. ♂ = 18. Organ Mountains. Near R. Pacaqué.
Agrees in all respects with Westwood's notes. Burchell's manuscript label was missing from 18. The date was recovered from Westwood's list.

Pseudoscada acilla, Hew.

4. 11. 25. ♂ = 19. Minas Geraes. Francisco Manoel's Rancho. Near Nepômucéna.

8. 2. 26. ♂ = 20. Organ Mountains. (As 10-12.)

9. 2. 26. ♂ = 21. " " "By the River Pacaqué."

Agrees in all respects with Westwood, except that 15 was also included under *acilla*.

Ithomia agnosia, Hew.

10. 11. 25. 3 ♂ = 22-24. Minas Geraes.

These three specimens were carefully compared with twenty-three in the Hope Department, one in the British Museum, and a series in the Godman-Salvin Collection, none, however, being from Brazil. A very few examples (one from Colombia) in the Godman-Salvin Collection occur approaching the Burchell form. The Burchell specimens vary from the usual form in having no extension of the black diagonal band on the fore wing into the interspace between the second and third median nervules, and a narrower marginal band on the hind wing. The general effect of the difference between these in the specimens mentioned above is that the transparent part of the wings is much more prominent in the Burchell examples. In fact the difference resembles that between *phenomoe* and *Burchelli* (compare figs. 3 and 4 with 1 and 2 on Pl. VI.), described on p. 315. In both cases South-East Brazil is characterized by a form in which the transparent area of the wings is increased at the expense of the black markings.

Agrees with Westwood's notes. He had written the words "*agnosia*, var.," on 22.

Ithomia phono, Hübn.

No data. ♀ = 25.

Bz. 196. I. 8. 9. 25. ♀ = 26. Rio Janeiro (along the Aque-duct). "*Papilio (Heliconius)* In Sylva."

852. I. + 24. 10. 25. ♀ = 27. Minas Geraes. "About João Pedro's at Discoberto: at the margin of the forest."
 "Papilio."
 10. 1. 26. ♀ = 28. Rio de Janeiro, Praia Grande, and vicinity.
 14. 1. 26. ♀ = 29. Rio de Janeiro. Valley of Laranjeiros and about São João de Carahý at Laranjeiros.
 11. 2. 26. 2 ♂ = 30, 31. Organ Mountains. (As 16, 17.)
 Bz. 18. 3. 26. 2 ♂ = 32, 33. Rio de Janeiro. Along the Carioca Aqueduct.
 16. 9. 26. 2 ♂ = 34, 35. Santos. (As 1, 2.) Brazilian label on 34.

Agrees in all respects with Westwood, save that as regards either 32 or 33 he had written "1 ♂ with v[ein] of H. W. abnormal."

Pteronymia hemixanthe, Feld.

- Bz. 335. II. 15. 10. 25. ♀ = 36. Minas Geraes. "*Gap[ilio]*.
 At the Discoberto do Antonio Velho. In floribus *Liatrideæ albifloræ*."
 907. III. + 25. 10. 25. 2 ♀ = 37, 38. Minas Geraes.
 "*P[apilio]*. At Discoberto, near João Pedro's house."
 Specimens not sexed by Westwood. His determination agrees.

Pteronymia euritea, Cram.

- Bz. 317. I. 14. 10. 25. ♂ = 39. Minas Geraes. Discoberto.
 "Horta."
 Bz. 907. III. + 25. 10. 25. ♀ = 40. Minas Geraes. (As 37, 38.)
 8. 11. 25. ♂ = 41. Minas Geraes. "*Sylvatica*."
 8. 2. 26. 2 ♂ = 42, 43. Organ Mountains. (As 10-12.)
 9. 2. 26. 2 ♂ ♀ = 44, 45. " " (As 21.)
 11. 2. 26. 2 ♂ ♀ = 46, 47. " " (As 16, 17.)
 14. 2. 26. ♀ = 48. " " (As 18.)
 21. 2. 26. ♂ = 49. " " Near the R. Pa-
 caqué, "along the road by the Rancho for 1½ mile from the house."
 18. 3. 26. 2 ♂ = 50, 51. Rio de Janeiro. (As 32, 33.)
 Bz. 26. 11. 26. ♀ = 52. Santos. (As 8.)

[The fact that the two closely similar species, *hemixanthe* and *euritea*, are to be found flying together is of much interest. Their remarkable resemblance in the fresh state is well shown by the inability of this acute observer to discriminate between them. Thus no. 907 was found upon two specimens of the

first-named species (37 and 38) and upon one of the last-named (40). But the group also includes another less nearly related species which Burchell failed to separate. The number 335 is found upon *P. hemixanthe* (36) and *Heteroscada yanetta* (130), indicating that they were taken for the same species on the same day visiting the same flowers, accompanied by *Pteronymia sao* (53) and *Dircenna dero* (67, 68), both of which were recognized as distinct. Furthermore, in the note-book we find the numbers "335 . . . (317)," indicating a second time that the latter, *P. euritea* (39), was considered to be the same as *hemixanthe*, and, in this case, the same as *H. yanetta* also.

Burchell was able to penetrate the disguise of other examples of mimicry, such as the resemblance of certain Hemiptera for the Hymenoptera; but in the remarkable synaposematic likeness between the nearly allied species of Ithomiinae there was nothing to arrest his attention.—E. B. P.]

Specimens not sexed by Westwood. His determination agrees. He gives the dates of six additional specimens of *euritea* which cannot now be found. One of these bore the same date as 42, 43, two the same as 44, 45, one the same as 48. One was dated 4. 11. 25 (Minas Geraes, near Nepomucena, Francisco Manoel's. The notes show that the specimen might have been captured by "some tropeiros from the rancho"). One was dated 31. 12. 25 (Rio; on the Corcovado Mountain, and in the Valley of Laranjéiros).

Pteronymia sao, Hübn.

Bz. 338. I. 15. 10. 25. ♀ = 53. Minas Geraes. "Pap[ilio] cum 335." (As 36. The whole note applies to 53.)

Agrees in all respects with Westwood's notes.

Pteronymia nr. artena, Hew.

8. 2. 26. ♀ = 54. Organ Mountains. (As 10-12.)

14. 2. 26. ♂ = 55. " " (As 18.)

Compared with Hewitson's type of *artena* in the British Museum, 54 and 55 appear to be a less heavily marked form of the same species.

On 55 Westwood had written "*artena* but with only a minute white stigma instead of a larger 4-patch," and as regards 54 a difference in venation is alluded to and explained by reference to a rough diagram. The sexing agrees.

Pteronymia sylvo, Hübn.

12. 11. 25. ♂ = 56. Minas Geraes. "At Mandioca."

cent. greater than in *phenomoe*. Furthermore, in the former, but not in the latter, the band is continued in a much narrower form along the second median nervule until it joins the black hind marginal border near the anal angle of the wing. The development of this important marking gives it a different shape, the proximal border being markedly concave in *phenomoe*, straight or slightly convex in *Burchelli*, the concavity of the distal border being more pronounced in *Burchelli*.

The type of *Burchelli*, specimen 64 from the junction of the Rio Araguay with the Rio Tocantins, is represented in Pl. VI. fig. 1.

Distribution (based on the specimens in the Godman-Salvin Collection and the Hope Department).—*Burchelli* occurs in the northern part of Eastern Brazil, *phenomoe* in the southern part, in Argentina, and Venezuela.—E. B. P.]

On specimen no. 65 there is a scrap of paper on which Professor Westwood had written in pencil "Like *phenomoe*, but larger black band. [? is it a] black var." There is uncertainty as to the correct interpretation of the letters enclosed in square brackets. On 63 he had written a list of the dates of specimens 60-65, and opposite 19. 5. 29 are the words "2 ind. fascia longiori." In his list of Heliconiidae the words are "2 ind. fascia ad apicem cellulæ magis elongata." There is also a statement that he submitted a specimen to Hewitson, who probably suggested the name "*flora* black var.," which has been added in pencil. These butterflies were carefully compared with others in the Hope Department and the Godman-Salvin Collection, and it was found that this heavy type of marking is probably characteristic of a large section of the northern part of Eastern Brazil, for two similar forms captured by the late T. Belt in Maranhão exist at Oxford, while the Godman-Salvin Collection contains one similar form from Pernambuco and one from Bahia. The latter collection also contains eight specimens from Argentina, one from Rio, and a series from Venezuela. All these, together with the Burchell specimens from South-East Brazil (nos. 60-63) and two Miers specimens (probably Rio) at Oxford, are of the ordinary form, with lighter markings, as also are six specimens in the British Museum, which, however, are without localities.

Dircenna hulda, Feld.

31. 1. 26. ♀ = 66. Rio de Janeiro. "Valley of Catombé and a high mountain on the N.W. side of the Aqueduct."

"All of this date were from off plants, mostly up the Valley of Catumbí."

The specimen was named by Westwood *epidero*.

Dircenna dero, Hübn.

Bz. 340. II. 15. 10. 25. 2 ♀ = 67, 68 (Pl. VI. fig. 6). Minas Geraes. "*P[apilio]* cum 335." (As 36, and taken with it "in floribus *Liatrideæ albifloræ*.")

Bz. 475. II. 16. 10. 25. 2 ♀ = 69, 70. Minas Geraes. Discoberto. "*Papilio*."

Burchell wrote "475 . . . (340)" in his Brazilian note-book, indicating his recognition that the four specimens 67-70 belonged to the same species.

Bz. 546. I. 18. 10. 25. ♀ = 71. Minas Geraes. Discoberto. "*Papilio*."

28. 10. 25. ♀ = 72 (Pl. VI. fig. 7). Minas Geraes. "In the Forest on the West and on the East side of S. João de Nêpomucéna."

29. 10. 25. ♀ = 73. Minas Geraes. "In the Forest on the S.E. side of S. João de Nêpomucéna."

1. 8. 27. ♂ = 74 (Pl. VI. fig. 5). Near S. Paulo: on road between Jundiahly and Capivary. "Iter faciendo."

Burchell's manuscript labels are reproduced to the right of the three figures on Pl. VI. (5-7) to which they respectively refer. That accompanying fig. 6 was written in Brazil, the others in England.

Westwood, in his complete list, mentions two individuals captured on 28. 10. 25. He also gave a list of captures on a label attached to 70, and this agrees with the numbers and dates here recorded. It is therefore probable that the former is erroneous and that there were not more than eight individuals. On 68 Westwood had written "This is the only individual with the veins of H. W. suffused with black." The specimen is shown on Pl. VI. fig. 6, where the feature mentioned by Westwood can be clearly seen when comparison is made with figs. 5 and 7. Westwood does not note the sexes. He employs the name *dero* only.

[I have followed H. W. Bates in regarding *D. rhoëo*, Feld., as a form of *dero*, differing "only in the greater breadth and irregularity of the dusky black border of the hind wing, especially in the female, and in the nervures which traverse the disk of the same wing being of a yellowish colour instead of black. In the female the discocellulars and the terminal parts of the median branches are accompanied by dusky streaks." *D. dero*, on the other hand, "has the hyaline

disks of the wings always clearer and the black borders more sharply defined than *D. rhoëo*. *D. dero* is peculiar to South-East Brazil, and is not found in the Amazon region, where the local form *D. rhoëo* takes its place. I have seen specimens of *D. rhoëo* also from the neighbourhood of Bogotá, New Granada. It flies in thinned parts of the forest in Ygapó, or flooded districts, in the dry season." (Trans. Linn. Soc. Lond. vol. xxiii., 1862, pp. 520, 521.)

I have quoted from Bates in full because, if his information be correct, we have here certain evidence of change in a local subspecific form within the narrow limits of five-and-twenty years. All Burchell's specimens come from South-East Brazil, and only two of them, viz. nos. 67 and 74 (Pl. VI. fig. 5), can be regarded as *dero*. All the rest are examples of the heavily marked yellowish hind-winged *rhoëo* (compare figs. 6 and 7 with 5). It would be unwise to build too much on the conclusion that a change has occurred, especially as the interval cannot be more than about twenty-five years, inasmuch as Bates, when he wrote in 1861, was dealing with experiences which went back many years. But if his statements that "*dero* is peculiar to South-East Brazil" and that *rhoëo* takes its place to the north be confirmed, we are compelled to admit that a rapid change has occurred in the former area and that in 1825 *rhoëo* was dominant there. We should be obliged to regard the biological history as traversing the history laid down by systematics; for *dero*, with the older name, would then be but a very modern local form of the more ancestral although more recently named *rhoëo*. Should further enquiry support Bates's statement, it seems probable that synaposematic grouping has directed the trend of evolution—that resemblance to more heavily marked transparent Ithomiine associates in the north has been an advantage which has caused the persistence of the pronounced black markings of *rhoëo*, while *dero* has been selected as an approach towards less heavily marked members of Ithomiine groups in the south.

Ithomiine butterflies with a general resemblance to one another have a marked tendency to fly together, as Bates points out in this very species (*l. c.* p. 521). It has already been found in the case of *Leucothyris phenomoe* that the northern part of Eastern Brazil is characterized by a more heavily marked form (*Burchelli*) than the southern part (see p. 315). In many other cases the tendency towards a reduction of the black markings of transparent and black Ithomiinæ in South-Eastern Brazil has been shown in this memoir. It was apparent in *Pseudoscada* sp. nr. *utilla* (15),

Ithomia agnosia (22-24), and *Pteronymia* nr. *artena* (54, 55). This reduction of black and increase of transparency occurring independently in many genera is probably due to selection in the direction of synposematic or Müllerian resemblance.—E. B. P.]

Ceratinia eupompe, Hübn.

29. 10. 25. ♀ = 75. Minas Geraes. (As 73.)
 4. 11. 25. ♂ = 76. Minas Geraes. (As 19.)
 8. 2. 26. ♂ = 77. Organ Mountains. (As 10-12.)
 9. 2. 26. 3 ♀ = 78-80. ,, ,, (As 21.)
 11. 2. 26. ♀ = 81. ,, ,, (As 16, 17.)
 12. 2. 26. 2 ♀ = 82, 83. Organ Mountains. "By the River Pacaqué."
 No data. ♀ = 84.

Westwood's notes and label agree in including an additional specimen dated 14. 2. 26 (Organ Mountains). In other respects his MS. agrees with the data here recorded. The determination agrees, but sexes are unnoted.

Ceratinia euryanassa, Feld.

- Bz. 563. I. 19. 10. 25. ♀ = 85. Minas Geraes. Discoberto. "Pap[ilio]."
 10. 11. 25. ♂ = 86. Minas Geraes. Discoberto.
 26. 9. 26. 5 ♂ = 87-91, 4 ♀ = 92-95 (92 and 95 bear Brazilian labels). Santos. "In a walk to Montserrat."
 "These *Papiliones* very plentiful in the woods": this referring of course to all specimens taken.
 No data. ♀ = 96.

Westwood gives two more individuals captured 26. 9. 26, and omits the date 10. 11. 25. The latter may be a slip or may be due to the later transposition of labels. In other respects and in the determination Westwood's notes agree, but sexes are omitted.

Ceratinia deta, Boisd.

- Bz. 330. II. 14. 10. 25. ♂ = 97. Minas Geraes. Discoberto. "Papilio (*Horta*)."
 It is probable that this specimen should bear the number 336 and that it was captured with 98 on Oct. 15th. See note on 108.

- Bz. 336. II. 15. 10. 25. ♂ = 98. Minas Geraes. "At the Discoberto do Antonio Velho. Pap[ilio]. In Sylvis."
 Bz.+ 12. 11. 25. ♂ = 99. Minas Geraes. "At Mandioca."
 "*Langsdorfi*" is written on the Brazilian label.

12. 2. 26. ♂ = 100. Organ Mountains. (As 82, 83.)
 21. 2. 26. ♀ = 101. " " (As 49.)
 No data. ♀ = 102.

The numbers and dates agree with Westwood's notes. Westwood's determination was *Ithomia melphis*, a synonym of *data*. The sexes were unnoted.

Ceratinia Barii, Bates.

26. 5. 29. ♂ = 103. Rio Tocantins, N. of Itabóca, below the Falls of Guaríba. "Sylva."
 Brit. Mus. "*Ninonia* Hew. var. *barii*."
 Named by Westwood *Ithomia ninonia*. Sex unnoted.

Mechanitis polymnia, Linn.

30. 10. 25. (Date probably erroneous, and should be 3. 3. 28 or 10. 12. 29. See below.) ♀ = 104. Minas Geraes. " (In the Forest.) On the N.E. side of the arraial of São João de Nêpomucéua." Locality probably erroneous, and should be Goyaz or Pará.
 5. 3. 28. ♂ = 105. Goyaz. "Caught by the Rio Vermelho, near the Carioca Aqueduct, by 'C'." C refers to Congo, Burchell's native assistant.
 7. 6. 29. ♀ = 106. Rio Tocantins. S. of Pará, Sta. Anna.
 7. 7. 29. ♀ = 107. Pará. "Eastward of my house."

[105 was submitted to the late Mr. Osbert Salvin on Jan. 16, 1896. He considered it to be the "Guiana form of *Mechanitis polymnia*." Although without the black hind wing which is so common in Guiana, the black markings are strongly developed on the secondaries of all the three female specimens, resembling many of the individuals from Surinam &c. The occurrence of such strongly marked forms so far to the south as Goyaz was a surprise to me. The somewhat faint but distinct subapical light bar of the fore wing, which is characteristic in Guiana, is evanescent or absent in these specimens. —E. B. P.]

Westwood records two additional specimens, captured 3. 3. 28 (Goyaz. "Caught in the town by the Rio Vermelho; by C[ongo]") and 10. 12. 29 (Pará. "Suburbanæ"). On the other hand, he does not give the date now affixed to 104, viz. 30. 10. 25. It is probable that a label has been transposed in the manipulation of the specimens, and that 104 should bear the date 3. 3. 28 or 10. 12. 29. In other respects and in the determination Westwood's notes agree with these records. The sexes were unnoted.

Mechanitis lysimnia, Fabr.

Bz. 336. II. 15. 10. 25. ♀ = 108. Minas Geraes. (As 98.)

[It is probable that this specimen should bear the number 330 and that it was one of the "*Papilio (Horta)*" captured on Oct. 14 at Discoberto. Burchell probably accidentally interchanged its label with that of 97, either originally in Brazil or later when he set the specimens. The evidence is as follows:—The Brazilian note-book shows that two individuals believed by Burchell to be one form "*Papilio (Horta)*," captured on Oct. 14, were numbered 330, and that two others also believed to be one form, taken on Oct. 15 "in Sylvis," were numbered 336. Professor Westwood's list, repeated on a specimen of each species, agrees with the existing specimens in showing one 336 on *Mechanitis lysimnia* (108) and the other on *Ceratinia deta* (98). One 330 is on *deta* (97) and the other is now missing, but both of Westwood's lists agree in recording that it was affixed to a specimen of *lysimnia* which cannot now be found. Either Burchell twice paired *deta* and *lysimnia* as the same form on consecutive days or he accidentally interchanged one 330 with one 336. The following fact confirms the opinion that he made the latter mistake and not the former. A few days later, on Oct. 19th, we find in his note-book the following entry: "563 . . . (336)," indicating his belief that the single specimen denoted by the first number was the same species as the two individuals denoted by the second. Now 563 is *Ceratinia euryanassa* (85), a species which closely resembles *C. deta*, but only bears a very rough likeness to *M. lysimnia*. It is therefore probable that 330 was intended for two specimens of *M. lysimnia* and 336 for two of *C. deta*.—E. B. P.]

4. 11. 25. ♂ = 109, 2 ♀ = 110, 111. Minas Geraes. (As 19.)

10. 11. 25. 2 ♂ = 112, 113. Minas Geraes.

6. 12. 25. ♂ = 114. Rio de Janeiro. "In an excursion to the Summit of the Corcovado by the road by the Convent of Sta. Theresa, and along the Aqueduct."

31. 1. 26. ♀ = 115. Rio de Janeiro. (As 66.)

9. 2. 26. ♀ = 116. Organ Mountains. (As 21.)

12. 2. 26. ♀ = 117. " " (As 82, 83.)

16. 2. 26. ♀ = 118. " " Near River Pa-caqué.

21. 2. 26. ♀ = 119. " " (As 49.)

28. 2. 26. ♀ = 120. "On the Rio Magé."

1. 3. 26. ♀ = 121. "Along the River Magé, upwards to the Fazénda da Lagóa."

7. 3. 26. ♀ = 122. Rio de Janeiro. "At Catombí."
Bz. 9. 3. 26. ♂ = 123. Rio de Janeiro.
 10. 3. 26. ♂ = 123 A. Rio de Janeiro.
 15. 9. 26. ♂ = 124. Santos. "*Papil*[io]. At edge of the Forest, at S. Bento Monastery."
Bz. 14. 12. 26. ♀ = 125. Cubatão, Lower Slopes of the Sérra.
 16. 12. 26. ♀ = 126. Cubatão. "Middle Part of the ascent up the Sérra."
 4. 3. 28. ♀ = 127. Goyaz. (As 105.)
 Westwood's name and list agree, except that he includes two more specimens which cannot now be found—one distinguished by the number 330, and a second specimen captured with 116 on 9. 2. 26. Sexes unnoted.

Aeria olena, Weym.

- Bz.* 579. I. 21. 10. 25. ♀ = 128. Minas Geraes. "In a rossa at Discoberto, and along a channel (on the margin of the Forest) which conducts water to the house."
 "*Pap*[ilio]."
 Named *I. elva* in Westwood's list, which otherwise agrees. Unsexed.

Heteroscada gazoria, Godt.

10. 11. 25. ♂ = 129. Minas Geraes.
 Westwood's list agrees. He calls the specimen "*Napeogenes?*" in list, but on the insect itself he had written "*Yanina*, Hew. f. 116, pl. 19, vol. ii. Hew. Exot. butt. *Euritea*, Dry., not Cramer." Unsexed.

Heteroscada yanetta, Hew.

- Bz.* 335. II. 15. 10. 25. ♂ = 130. Minas Geraes. (As 36.)
 Agrees with Westwood's list. Named *Napeogenes*. Unsexed. "Coll. Hew. but not named" in pencil indicates an unsuccessful reference to his friend Hewitson.

Heteroscada fenella, Hew.

29. 10. 25. ♀ = 131. Minas Geraes. (As 72.)
 Agrees with Westwood's list "Lent. Hewitson." The name "*fenella*, H." written in pencil by Westwood across Burchell's label. Unsexed.

Melinæa paraiya, Reak.

8. 2. 26. ♂ = 132. Organ Mountains. (As 10-12.)

Agrees with Westwood's list, where, however, it is named as a var. of *egina*. "*Mech. egina*" is written on a label attached to the specimen. Unsexed.

Melinæa egina, Cram.

7. 7. 29. ♂ = 133. Pará. (As 107.)

28. 7. 29. ♂ = 134. Pará.

Bz. 26. 1. 30. ♂ = 135. Pará.

Agrees with Westwood's list. Unsexed.

Melinæa ethra, Godt.

8. 2. 26. ♂ = 136. Organ Mountains. (As 10-12.)

Agrees with Westwood's list. Named by him *Mech. ethra*. Sex unnoted.

Methona themisto, Hübn.

14. 7. 29. ♂ = 137. Pará.

31. 7. 29. 2 ♂ = 138, 139. Pará.

Westwood's list indicates the former existence of a fourth specimen captured at Pará on 30. 7. 29. His name agrees. Sexes unnoted.

[To be continued.]

XXXVIII.—*Note on an undescribed Weasel from the Atlas Mountains, and on the Occurrence of a Weasel in the Azores.* By G. E. H. BARRETT-HAMILTON.

THROUGH the courtesy of the Director and Officials of the British Museum of Natural History, I am enabled to publish a short description of a weasel which is clearly distinguishable from the forms recognized by me in my paper published in this Journal in January 1900.

This form, which may be known as *Putorius nivalis atlas*, is remarkable for its size and robustness, in which it is perhaps only excelled by the true *P. n. africanus* of Desmarest. On the other hand, the line of demarcation between the colours of the upper and under surfaces, a highly characteristic feature in the weasels, is widely different from that of *P. n. africanus* and other forms with a similar arrangement, such as *P. n. numidicus*, *P. n. boccamela*, and *P. n. subpalmatus*, and allies it to *P. n. ibericus* and *P. n. siculus*. In its tail, however, which carries a distinct terminal "pencil"